NOT TO BE TAKEN AWAY

THE

BRITISH JOURNAL

OF

CHILDREN'S DISEASES.

Vol. XII. JULY, 1915. No. 139.

Original Articles.

ON THE BACTERIOLOGY OF CEREBRO-SPINAL FEVER.*

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Whereas the clinical diagnosis of cerebro-spinal meningitis may at times present very real difficulty, the laboratory examination of the cerebro-spinal fluid can generally establish the diagnosis of the disease in a very short time. In some cases the fluid is obviously turbid on removal from the body. When that is the case the diagnosis of meningitis is certain, but not the particular kind of meningitis; it might be meningococcal, pneumococcal, influenzal, streptococcal, etc. It is in distinguishing the variety of meningitis, and thereby giving a clue to the appropriate treatment of the case, that bacteriology comes to our aid.

The organism of cerebro-spinal meningitis was first carefully described by Weichselbaum (11) in the year 1887, though it had probably been seen previously by other observers (Marchiafava and Celli (9) in 1884; Leichtenstern (7) in 1885).

Weichselbaum found it in the ventricular fluid and meningeal exudate of six out of eight cases of primary apparently sporadic cases of meningitis. It was a Gram-negative diplococcus, and as it often occurred in numbers within the leucocytes he named it the

* Being a contribution to the discussion on "Cerebro-Spinal Fever," at the Harveian Society, on April the 22nd, 1915.

Diplococcus intracellularis meningitidis. He showed that it was an obligatory aërobe—that is to say, it would grow only in the presence of air or oxygen—and that its optimum temperature was 37° C. He found also that it grew best on media containing animal proteins, and even on these media tended to die out very rapidly unless sub-cultured every day or two. Weichselbaum's observations were forgotten for some years, and it was not until 1895 that interest in them was revived. In the meantime, namely in 1891, Quincke had introduced his method of lumbar puncture, whereby the accurate clinical study and pathological diagnosis of meningitis were enormously advanced.

In 1895, Jaeger (5) isolated a diploccocus from a number of cases of meningitis, which differed from Weichselbaum's meningococcus in several respects. While it was Gram-negative in sections, it was Gram-positive in the exudates and in cultures; it grew well on ordinary agar and in broth at both room and body temperatures; and it was considerably more resistant than the Weichselbaum diplococcus to heat, drying, and such like external influences. In the following year Heubner (3) isolated a similar Gram-positive diplococcus from a few cases of the disease. Other observers appeared to confirm this observation, and the result was the belief that there were two types of the meningococcus—the Weichselbaum type and the Jaeger-Heubner type.

The apparent result of the more recent investigations of epidemics of meningitis in Europe and America, aided as they have been by the fermentation tests and serum reactions (agglutination, absorptive power, and fixation of complement), has been to establish the claims of the Weichselbaum diplococcus as the causal agent of cerebro-spinal fever. This will be gathered from the following statement of Ledingham (6) in his recent article on "The Bacteriology of Cerebro-spinal Meningitis": "The meningococcus of Weichselbaum is universally regarded as the essential specific cause of epidemic cerebro-spinal meningitis, as also of certain forms of sporadic meningitis." Possibly, however, the facts may not be so simple as this, for in very recent papers by Hort, Lakin, and Benians (4) doubt is thrown upon the generally accepted view that the Weichselbaum meningococcus—as we know it—is the infective agent in meningitis. These observers think it possible that "in cerebro-spinal fever the meningococcus might prove to be a late non-infective phase in the life-history of a minute organism not yet discovered, which is only infective in its earlier stages, that is to say, it is only in these early stages that it causes the disease." They have

examined the urine, blood, and cerebro-spinal fluid of a number of acute cases of cerebro-spinal fever, and from the great majority of these—especially from catheter specimens of urine—they have isolated the Gram-positive and Gram-negative organisms of Jaeger. They have made the interesting observation that the Gram-negative diplococci in urine (morphologically indistinguishable from the meningococci or gonococci), on cultivation, appeared to merge into Jaeger's organism, colonies of Gram-postive and Gram-negative rounded cocci alone surviving. Further, from a specimen of urine, *filtered through a Berkefeld filter*, they were able to grow colonies of a very pleomorphic organism, a film of a *single* colony showing (1) Gram-negative diplococci like meningococci, (2) also a few Gram-positive forms, (3) small Gram-negative bacilli, (4) Jaeger's organism, (5) Gram-positive diplococci and other forms. From this it would appear that the urine in cerebro-spinal fever may contain an ultra-microscopic form of the infective agent, and whether subsequent investigation confirms or disproves this theory, for the present it will be a wise precaution to disinfect the urine in all cases of the disease.

Before leaving the historical part of the subject, reference must be made to the diplococcus described by Still (10), in 1898, in the posterior basic meningitis of infants. Still's organism closely resembles the meningococcus of Weichselbaum, but was said to grow more readily on the ordinary culture media and to be more hardy than the Weichselbaum coccus. If they differ at all they do not do so *specifically*, but only as *variants* of the same organism.

Next, a few remarks as to the morphology and biology of the meningococcus. It is a small, Gram-negative diplococcus, often kidney shaped, with the flattened surfaces opposed and with a narrow space between them. Morphologically it is identical with the gonococcus, and, like it, is often found in considerable numbers within the leucocytes. It is a difficult germ to grow, and for its isolation requires serum, ascitic fluid or similar protein-containing substance in the nutrient medium. After a variable number of sub-cultures on such a medium it will grow on ordinary media, but apparently it cannot lead a saprophytic life outside the human body. It is very susceptible to cold and to drying. The former weakness has to be borne in mind when cerebro-spinal fluid is to be examined for meningococci. The fluid should be examined as soon as possible after removal from the body if cultures are to be made, and during the interval between removal and culture it should be kept at or near the body temperature. It is generally stated that the meningococcus

will not grow below 25° C., though Lieberknecht (8) has shown that growth at temperatures below 37° C. is favoured by the addition of hæmatin to the culture medium.

The meningococcus ferments glucose and maltose with the production of acid; the gonococcus ferments only glucose, and the *Micrococcus catarrhalis*, which may be confused with the meningococcus when naso-pharyngeal swabs are being examined, ferments neither glucose nor maltose.

Some strains of meningococcus are agglutinated by the serum of meningitis patients, or by an artificially prepared anti-meningococcus serum, but Elser and Huntoon (1 and 2), Arkwright and others have found that a considerable proportion of strains of meningococcus are not agglutinated by a monovalent serum.

The meningococcus in the human body.—Many observers have found the meningococcus in the blood in cases of cerebro-spinal meningitis. Elser found it in eleven out of forty-one cases. Possibly, if the citrated blood of patients were incubated, instead of adopting the usual procedure of adding a few cubic centimetres of blood to nutrient broth, a larger percentage of positive results would be obtained. In a number of recorded cases the meningococcus has been found in the blood without marked, or even any, evidence of meningitis. Such pronounced cases of meningococcal septicæmia are usually, if not always, fatal; but it is highly probable that cerebro-spinal meningitis is always *primarily* a blood infection, and that the brain and spinal cord are simultaneously infected from the blood. If the infection of the meninges were due to a direct spread from the naso-pharynx, we should expect the brain to be infected considerably earlier than the spinal cord.

The meningococcus also occurs in the naso-pharynx of a large number of patients early in the disease, and it has been found, though rarely, in other parts of the body. Lastly, but not least in importance, it occurs in the cerebro-spinal fluid and meningeal exudate.

The cerebro-spinal fluid in meningococcal meningitis.—In a marked case of cerebro-spinal meningitis the fluid is usually turbid, often markedly so, and after centrifuging shows a thick sediment like creamy, viscid pus. Under the microscope this consists mainly of polymorphonuclear leucocytes with a small admixture of mononuclear cells. Stained by Gram and counter-stained with dilute carbol fuchsin or Bismarck brown, meningococci are generally seen —often in very large numbers—within and outside the cells. They are Gram-negative, and are stained red or pale brown according to the counter-stain employed.

The albumin of the fluid is much increased; from 0·02 per cent., the normal amount, to 0·5 or 0·6 per cent. or even more. Sugar is generally absent. Primary cultures from the purulent sediment planted on ordinary agar will often grow the meningococcus, as the "pus" in the sediment furnishes sufficient albuminous matter for the needs of the organism. As previously stated, the fluid should be cultured as soon as possible after removal and have been kept warm in the interval. Subsequent subcultures fail to grow on ordinary agar, and require for their success a serum or ascitic fluid agar. Even better results are obtained with Kutscher's medium, which is a serum placenta agar. Sometimes when the direct examination of the fluid fails to reveal the meningococcus or shows only a few cocci, incubation of the fluid itself overnight at 37° C. will allow the organisms to multiply to such an extent that they are easily found in the sediment and grow luxuriantly on Kutscher's medium. I have found this on several occasions recently.

Effects of serum treatment on the cerebro-spinal fluid.—I cannot enter here into the details of treatment, but shall just mention the changes which occur in the cerebro-spinal fluid consequent upon lumbar puncture and the intrathecal injection of Flexner's anti-meningococcal serum :

(1) Diminution in the amount of albumin. In a recent case of Dr. Frederick Batten's, in which I made daily examinations of the cerebro-spinal fluid, the albumin was 0·55 per cent. (before the injection of serum) and 0·45, 0·3, 0·3, 0·22 per cent. on successive days, the patient receiving daily intrathecal injections of 10 or more c.c. of serum.

(2) Rapid diminution in the number of cocci, and more particularly of the extra-cellular cocci. Those which persist are almost entirely intra-cellular. This was well seen in the case just referred to; on the first day, before serum was injected, the cocci were very numerous and were extra- and intra-cellular. On the second day, after only one injection of serum, they were much diminished in number and practically all intra-cellular; on the fourth day no cocci could be found in films of the sediment, and on culture the fluid was sterile. When this result is attained, the serum injections should no longer be given.

(3) Diminution in the number of polymorphonuclear leucocytes ("pus" cells) and consequent clearing of the fluid. During convalescence the fluid may become more turbid again for a day or two and show an increase in the number of polymorphs. Later on, as the polymorphs diminish, the mononuclear cells increase in number.

(4) Return of the sugar.

Finally, it may take several months for the fluid to become quite normal again.

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PULMONARY TUBERCULOSIS IN CHILDREN.*

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Tuberculosis in children, and especially pulmonary tuberculosis in children, presents many difficulties. Although we have many very simple tests which may be applied to assist in the diagnosis of tuberculosis, we have nothing to aid us as to whether we are dealing with latent or active tuberculosis, except our experience and our stethoscope. It is very important to the child that we should be able to differentiate. To be notified nowadays as a case of pulmonary tuberculosis means much in the favour of the child. It also means much against it. I have been very much impressed with the effect of notification on the child. In the ordinary way of notification the home is visited by some official of the Public Health Department, who has naturally no knowledge of the difference between latent and active, or anatomical and clinical tuberculosis; but is armed with the methods of dealing with definitely infectious pulmonary tuberculosis. The windows must be opened, the curtains and the carpets removed, etc. The child must sleep alone, which means, in the present state of the housing of the working-classes, that, if carried out, the rest of the family is generally over-crowded. The child must have extra milk and good food, the extra milk

* A paper read before the Association of Registered Medical Women, on March the 9th, 1915.

generally not being possible in the present financial position of the working-classes, without upsetting the family budget. The strongest impression left upon the mother of the family is that the child is a consumptive and infectious, and consumption to the great majority of people still brings up a mental picture of a prolonged illness ending inevitably in death. The child is immediately treated differently from the rest of the family ; she is given the little extras, is not forced to take the ordinary food that is prepared, and becomes very much spoilt. She goes to school when she pleases, because the mother feels she cannot force her if she feels ill, knowing she is consumptive—a fact which a child very soon learns to trade upon. And as we are very hopeful of the ultimate cure of very many of these cases, she loses much that would be helpful to her later in life. At the same time the family and relations all talk with bated breath of "poor Mary, who is not long for this world." The mental atmosphere which grows around Mary is very unhealthy, and cannot assist her in her cure. If she is a case of latent or only suspected tuberculosis she is, in my opinion, very much better left unnotified, but kept under observation, although we lose, of course at present, the benefits to be gained by the improved hygiene of the home which has been instilled during the visits of the public health officials. The fact that the child is notified also prevents her from obtaining the benefits of convalescent home treatment, which in many cases is all that is required to restore her to health. It is very necessary for us, therefore, to safeguard the child by being sure of our diagnosis. That our ideas widely differ as to what constitutes pulmonary tuberculosis in children is evidenced by the fact that the amount of notifiable pulmonary tuberculosis in school children ranges with various observers from $\frac{1}{2}$ per cent. to 30 per cent.

Statistics taken from post-mortem work and from specific tests such as Von Pirquet's and Calmette's show a high degree of infection by the tubercle bacillus in early childhood. The post-mortem figures for children vary within wide limits. Thus Baginsky in Berlin found 18 per cent. tuberculous, Comby in Paris 38·5 per cent., Hamburger in Vienna 40 per cent., and Müller 43 per cent. With regard to the organs affected there is also much variation. Holt, in an analysis of 119 autopsies on tuberculous children, found the lungs affected in 99 per cent. and the bronchial glands in 96 per cent. Hamburger, in a series of 160 cases, found the lungs implicated in 50 per cent. and the bronchial glands in 96 per cent. The specific tests, such as Von Pirquet's, give a negative result in the

newly born, and show steadily increasing positive results until at 14 years of age 94 per cent. of school children give a positive result. Hamburger and Monti, working with school children in Vienna with Von Pirquet's test (which is the application of a 25 per cent. solution of old tuberculin to the skin which has been scarified), got a positive result in 94 per cent. of children of 14 years of age, and Calmette's results with the conjunctival reaction were almost identical. The basis of all these tests is a hypersusceptibility. In all subjects with tuberculosis a substance is present in the body which is able to set free, out of the tuberculin applied or injected, poisons which produce the tuberculin reaction. Owing to the ubiquity of the tubercle bacillus it is probably true that 94 per cent. of children aged 14 are tuberculised, but the majority of them are not affected by it. These tests give no information as to the character of the tuberculosis, its activity or the reverse. A positive reaction only indicates that the body somewhere and at some time has been infected by the tubercle bacillus. It has been shown that infancy is a period of extreme susceptibility and one of very limited resisting powers, the type of tuberculosis found in infants being the acute miliary form, which is rapidly fatal, or extensive glandular tuberculosis. As the age progresses more children suffer from tuberculous lesions, the mortality being less owing presumably to protective mechanisms being formed in the body. After 4 or 6 years of age the lesions tend to resemble those of adults. In regard to the channels of infection the two of importance are those of inhalation and ingestion. There is much to be said for infection by both these ways, but I am convinced that infection by inhalation is the most frequent method. Closely allied to this is the question as to whether infection is caused by the bovine or the human bacillus. At present, until we have conclusive evidence, it is safest to assume that infection is possible by both these channels, and by both the human and bovine bacillus, and therefore to be guarded against. In 1913 in the Woolwich Tuberculosis Dispensary, out of 1090 children examined under 15 years of age 160 were found to show definite signs of pulmonary tuberculosis, and of these 78 per cent. had a definite possibility of infection in the home. Of the 1090 children examined 260 were regarded as suspects and kept under observation, 160, as I have already said, were definite. Included in this number were all stages of pulmonary tuberculosis, definite early pulmonary tuberculosis, the caseous and the fibro-caseous cases, and also the group of tuberculosis of the bronchial glands. Fifty-two children showed other forms of tuberculosis, glands, bone joints, or subcutaneous

tuberculous abscesses; 618 children were non-tuberculous; 14·6 of the whole were definitely notifiable cases of pulmonary tuberculosis. This is a fairly high figure, but it is from a special *clientèle*, the children being mainly contacts of adult cases of pulmonary tuberculosis and cases of definite or suspected pulmonary tuberculosis sent through the school doctor, the Invalid Children's Aid Association, and all other agencies in the borough working for the welfare of children.

Before discussing the signs and symptoms of pulmonary tuberculosis in the different stages found in children I should like to quote Goodhart and Still's remarks on the differences to be found in the chests of normal children. "The breathing in children," we read, "is diaphragmatic, and it is difficult sometimes to detect the movement of the upper part of the thorax. Children breathe irregularly and also asymmetrically. It is quite a common thing to find a child breathing fully now with this side, now with that. I take this to be due not to muscular weakness, as some aver, but to the as yet imperfect education which is seen in all the muscles, whether of speech or of voluntary movement." This normal condition is not fully recognised, and is the cause of many children being placed under the suspect group, or even among the definite cases. In many cases of suspected pulmonary tuberculosis I have found that different examiners find the physical signs of poor expansion, impaired note, and weakened breath sounds on different sides—a fact which always helps one to make a negative diagnosis. With regard to the percussion of the chest in children, Dr. Still says: "It is not difficult to obtain a dull note which is *not* due to the lung underneath. A very little difference in the level of the two shoulders will effect this, and the irregularity of respiration so noticeable in children will do the same. Therefore in cases where the differences are slight it is always as well to be cautious in our opinion and probably to wait until a second examination has confirmed it." The auscultatory sounds in children also differ. It is usual to describe the respiration of children as puerile, *i. e.*, "the inspiratory murmur is harsh and the expiratory slightly prolonged, but the most frequent difficulty is to know whether you are dealing with bronchial breathing which is the result of disease, or with that which is due only to a temporary accelerated respiration. In young children it is not unusual to find the expiratory murmur in the upper two thirds of the back of a bronchial nature, longer than it should be, and higher pitched than it should be, and the question of the meaning of this can only be settled by close examination of both sides, and appeal to one's

experience." Here again if the breathing is of exactly the same quality on both sides doubt your diagnosis, should you have decided there is disease. It is fatal to *ask* young children to breathe; instantly they make a conscious effort they seem to forget how to breathe, and the efforts made are not the normal breath sounds.

In the suspect group at Woolwich we placed all children who showed any physical signs in the chest on repeated examination, such as poor expansion at one or other apex, or of one lung generally, with impaired resonance over the same area and weakened air entry. The air passages in all these children were examined, and any obstruction in nose or throat treated. As many as possible were given a course of breathing exercises, and the results were very satisfactory. With the better control of the muscles of respiration resulting from the exercises and the improved expansion many lost all the physical signs and were considered non-tuberculous. In this group also were placed children who showed the stigmata of tuberculosis, and who were living in homes in which there was an adult case of "open" tuberculosis. This group we considered the most important. The children were examined at one, two or three monthly intervals, this observation being kept up as long as the infection remained in the home. As many as possible of the latter were recommended for the playground classes at school or for the open-air school. The homes of all the suspect cases were visited by the nurses attached to the dispensary. In this way the hygiene of the home was, if necessary, corrected, and an occasional case of "open" pulmonary tuberculosis discovered.

The next group of the *incipient or early definite pulmonary tuberculosis* is the most difficult, and it is impossible to make a diagnosis on a single examination. These cases may have no more physical signs than the suspect group, but there is evidence of some toxæmia. The child is pale and ailing, there is loss of weight, there may or may not be a short cough and sweating at night. On a careful temperature record being taken, this shows a variation more than the normal. There is an irregular rise in the temperature. The rectal temperature gives the most accurate results. Exercise records sometimes give assistance, the temperature after exercise showing in the tuberculous subject a greater variation than the normal. The physical signs in the chest, especially those of auscultation, where the inspiration is found to be granular (or "sticky," I think, describes it better), and the temperature record, give most assistance in coming to a positive diagnosis. The hearing over the suspected area of a fine crepitation which does not disappear

on coughing, but which remains the same or increases, is a very important sign on which I personally lay great weight. But when this is found the case is perhaps beyond the stage of incipient pulmonary tuberculosis. A positive Von Pirquet or Calmette reaction adds weight, but does not help us to make a positive diagnosis. A focal reaction following an injection of tuberculin would show that the case was definitely tuberculous, but it is doubtful whether this method is justifiable in children. The presence of the tubercle bacillus gives us proof positive, but in these early cases there may be little or no sputum, and if there is sputum the child rarely expectorates it; it is coughed up into the pharynx and then swallowed. Dr. Holt, of New York, recommends that in all suspected or early cases where there is a cough one should attempt to get sputum for examination from the back of the throat. He suggests that a cough should be excited by irritating the back of the pharynx and the sputum caught on a piece of muslin or gauze. In the babies' hospital in New York in nineteen months seventy-seven cases of pulmonary tuberculosis were admitted. Sixty-two of the patients were infants under 2 and fifteen under 6 months of age. Bacilli were found in the sputum in 80 per cent. of the cases using this method. Nearly all these cases, however, were cases of tuberculous bronchitis with much secretion. A child aged 4 years was brought to see me at the Woolwich Tuberculosis Dispensary suffering from whooping-cough. I examined the child and found she had extensive broncho-pneumonia. In examining the throat I removed a small piece of sputum from the back of the pharynx and had it examined. It was found to be packed with tubercle bacilli, which showed me the value of the method, and also in this case partly altered the diagnosis. These definite cases require very careful treatment. The improved hygiene of the home and the open-air school is not enough. The regulated rest and exercise which are so essential in bringing about a permanent cure can only be got at a sanatorium, and the residential sanatorium school for a prolonged period gives the best treatment for these cases.

The caseous and the fibro-caseous cases found in children show signs and symptoms very similar to those found in adults, and the diagnosis is generally easy, but there are certain differences. The lesions are less often apical, and are frequently more extensive at the root of the lung or at the base. The older the child the greater the tendency to the fibro-caseous type. As the resistance and the age increase the disease becomes more of a chronic form. In infants where the resistance is *nil* the type found is the acute

miliary. The caseous type is a stage between this and the more chronic fibro-caseous form. Another point of difference that I have noticed is that the toxæmia is often very much less than would be expected from the area of lung affected, and in the fibro-caseous type fibrosis and contraction of the lung may take place to a large extent without causing the symptoms found in adults or much inconvenience to the child. Hæmoptysis in the caseous type is not so frequent as in adults and is generally small in amount, and when it does occur it does not render the child so ill. At Woolwich we had one small boy who had quite a large hæmorrhage for a child (about 5 oz.) at 10 a.m., and who spent the same evening bathing in the Thames with no evil results to himself. The mental factor and the fear of a recurrence so noticeable in adults is absent in children. Chronic bronchitis, bronchiectasis, and areas of unresolved pneumonia have to be eliminated before coming to a positive diagnosis, although all of these may take on a tuberculous character. The prognosis in both these forms is unsatisfactory. In the fibro-caseous form the condition may become very chronic, but sooner or later the disease lights up again, each exacerbation extending the disease area. As regards treatment, these are the cases that seem to require more than the hygienic and sanatorium *régime*. Treatment with tuberculin in some cases answers well.

Tuberculosis of the bronchial glands and hilus tuberculosis form a fairly large group, and give on the whole fairly definite signs and symptoms. Hilus tuberculosis includes, as well as tuberculosis of the bronchial glands, definite pulmonary tuberculosis at the hilus or root of the lung. The hilus, not the apex of the lung, is considered by many to be the primary focus of disease, especially in children, and possibly also in adults in all forms of pulmonary tuberculosis, the infection being the result of direct contact with the tuberculous bronchial glands. X-ray examination of the chest has done much to bring about this point of view. The bronchial glands appear to be involved early in the tuberculous process and to be very susceptible to the tubercle bacillus. As to how the infection reaches the glands is still a moot point. There are again the two schools, the one which considers that the infection passes from the air-passages or air-cells in the lung through the peri-bronchial lymphatics to the glands; the other which bases its results on the work of Calmette, who proved experimentally that young bovine animals after feeding on a diet containing tuberculous material showed the earliest lesions in the bronchial glands—that is to say, that the alimentary canal may be a direct path of infection. We know that these glands,

however infected, show a marked tendency to spontaneous cure, but they occasionally break down and give rise to a general infection, or they may rupture into a bronchus and set up an acute infection of the lung. The symptoms in these cases are sometimes fairly definite, sometimes the reverse. There is generally an indefinite and progressive condition of ill-health in a child who has been previously healthy, associated with much anæmia and lassitude. The child may appear quite well nourished but very flabby; a troublesome cough may be present, which is often in paroxysms; and also poor appetite, night sweats and a slight fever. Physical signs are only found if there is actual pressure on a bronchus preventing full inflation of the lung. Of two well-marked cases under my care the first was a small child of 15 months who was living in the same house with an acute "open" phthisis. The child was markedly pale and plump, but had very poor muscularity. He was the typical pretuberculous type. On examination I found definite dulness and absence of breath sounds all over the right lung. The left lung was absolutely clear, but had some exaggeration of the normal breath sounds. There were no adventitious sounds in either lung and no fluid. The X-ray examination was reported to show definite enlargement of the bronchial glands on the right side and some thickening of the bronchi in the region adjacent. The child was placed under the best conditions possible in the home, the diet improved, and cod-liver oil and malt given at the dispensary. The child was examined every seven or fourteen days; the breath sounds returned very gradually, but did not equal the breathing on the left side of the chest; the resonance returned, and the general improvement in the child was very marked. The other case was a child of 6 years, whose main trouble was an irritating cough and very marked anæmia for a prolonged period. In his case the dulness was only noted in the right interscapular region with weak breath sounds over the right lower lobe. In this case the X rays showed definite enlargement of the glands. These cases were well marked. There are many where the signs are very few, but an impairment of note in the interscapular region with weakened breath sounds is very suggestive, combined with the stigmata of tuberculosis. In all my cases the glands affected were on the right side. All cases of bronchial glands showing definite physical signs should be notified and receive treatment at a resident tuberculous school.

I should like to repeat that I consider the tendency of the moment is to label far too many children definitely tuberculous, and it is not to the advantage of the child. It is still too early to explain to the

general public that a child is not ill, although it is tuberculous. Observation is very necessary for all suspected cases, and could be carried out through the tuberculous dispensaries and the school. The definite early cases want to be taken in hand much more rapidly, since delay in these cases affects the chance of permanent cure, and the treatment should be prolonged.

Until we have much more definite ideas of what constitutes notifiable pulmonary tuberculosis or what does not, much indiscriminate notification will go on, and before we can arrive at that stage it will be necessary to revise and standardise the teaching and the nomenclature at the different medical schools.

Until this is done it is impossible to compare the results of different observers or to arrive at a real knowledge of the extent of tuberculosis in children.

SYPHILIS MENINGO-VASCULARIS, CONGENITAL SYPHILIS, CHOROIDITIS, OPTIC ATROPHY, HERPES ZOSTER, MULTIPLE ROOT LESIONS.*

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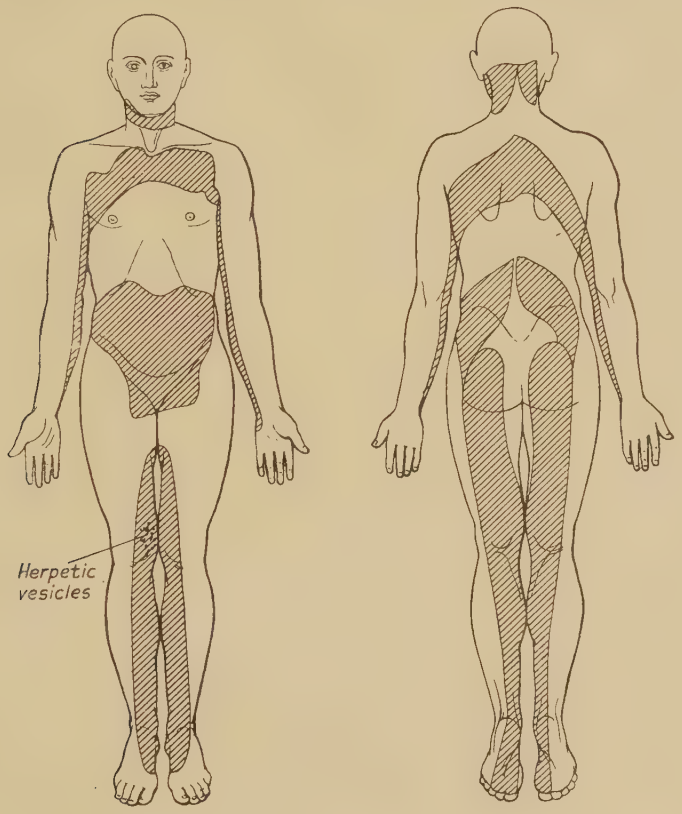
F. T—, born January, 1903.

Family history.—The patient's parents were both quite healthy until their marriage in 1894. Early in 1895 a healthy girl was born, who still survives. Shortly after the birth of this child the mother suffered from a chancre on the vulva and anæmia, but neither from rashes nor sore throats. Her second pregnancy ended with the birth of a seven months peeling child. At her third pregnancy twins were born at term, but both died before they reached the age of 4 months. Her fifth child was a boy who died of "cause unknown" at the age of 9 months. The patient was the sixth child of this marriage. His birth was followed by the birth of a premature child, of a girl now aged 9, of three miscarriages, and a girl now aged 5.

Personal history.—At birth the patient was a small child; as a baby he suffered from wasting. He walked and talked at the usual time, and as a baby only suffered from children's complaints. By

* The case was shown to the Neurological Section of the Royal Society of Medicine on February the 25th, 1915.

the age of 11 he had reached Standard IV. About May, 1914, he "began to go wrong." He complained of sick headaches, general weakness, pains in his body and limbs, fainting fits, retching, and became "irritable, jumpy, and restless of nights." In June, 1914, he first attended the Western Ophthalmic Hospital under the care



of Mr. E. Kenneth Campbell, and was there found to have choroido-retinitis. He was treated with iodides, but in spite of treatment vision gradually got more and more dim and his general condition became progressively worse. In January, 1915, he developed herpes zoster around the inner side of the right knee.

The patient is a small, well-developed child, aged 12 years, weighing 4 st. 12½ lb. He shows few stigmata of congenital syphilis. The head measures 19¾ in. in circumference, 14½ in. from nasion to inion, and the bimeatal circumference is 13½ in. The bridge of the nose is well developed and there are no scars around the angles of the mouth.

The teeth are not characteristic; the arch of the palate is high and narrow. He is blind, and with his right eye cannot even recognise the difference between light and darkness; with his left eye he is unable to count fingers. The optic discs on each side are in a condition of white atrophy. There is much excess of pigment around the margins of the left disc and evidence of old choroidal changes in both fundi. Smell and taste are unaffected, and hearing on both sides is good. He recognises the ticking of a watch at a distance of 12 in. with either ear. The corneæ show no evidence of old interstitial keratitis. The pupils are unequal in size, the right being the larger; neither reacts either to the strongest light or on attempted convergence. There is no actual ocular paralysis, but the visual axes are rarely parallel. Ptosis and nystagmus are absent. The movements of the jaws, face, palate, larynx, and tongue are completely unaffected. The tongue can be protruded straight and held steadily. Gait is normal. Romberg's sign is not obtained. Co-ordination of the hands is little impaired, and the alignment of the fingers is fair. There is no local muscular wasting, and the tone of the muscles of the extremities is unaffected. He has complained in the past of shooting and aching pains in the body, neck and extremities, but in recent times these have not been so troublesome. To sensory testing no gross loss of sensibility to stimulation with the pricks of a pin, the light touches of cotton-wool, pressure, passive movement, the vibrations of a fork, heat, cold, localisation, shape, size, form, weight and consistency, can be demonstrated. Over certain areas marked in the diagram he says that all painful stimuli seem "sharper," "hurt more," and are "funny." These areas seem to correspond with definite root-areas. The over-reaction is most intense on the inner side of the knees, and is greater on the right leg than on the left. The knee-jerks cannot be obtained even on reinforcement, and the ankle-jerks are abolished. Both plantar reflexes give a flexor response. The abdominal reflexes on both sides are extremely brisk. The wrist- and elbow-jerks are normal, and a jaw-jerk is obtained. The action of the sphincters is controlled. On the inner side of the right knee, at the level of the insertion of the tendon of the adductor magnus, is a patch of herpetic vesicles (1 in. by $1\frac{1}{4}$ in.), otherwise there are no vasomotor or trophic changes. He suffers from time to time from attacks of generalised headache, referred chiefly to the frontal region. The headache leads to a feeling of nausea, but rarely to actual vomiting. He has never suffered from fits or other forms of seizure. Speech is normal. Memory is fair and attention good. He sleeps well, but some weeks

ago suffered from nightmares and bad dreams. Hallucinations and delusions are not present. There are no abnormal signs in the heart, vessels, lungs, abdomen, testes, or urine. The Wassermann reaction both in the blood and in the cerebro-spinal fluid is positive, and the cells in the cerebro-spinal fluid number 25 per c.mm.

Until recently this case would undoubtedly have been diagnosed as one of juvenile tabes dorsalis and no anti-syphilitic treatment administered, but the sensory changes are those characterising a meningitic affection of the nerve-roots, and no evidence of any disturbance in the posterior columns is forthcoming. The appearance of a herpes zoster of the fourth lumbar area on the right side, whilst the patient has been under observation, confirms the diagnosis of the extra-medullary site of the principal lesions. Under treatment with intravenous injections of salvarsan or néo-salvarsan this patient should improve considerably. Another noteworthy feature in this case is the distribution of the root-lesions. In the nervous manifestations occurring after infection with acquired syphilis Head and one of us* have shown that the nerve-roots most commonly affected are those cervical roots which are related to the pharynx and tonsil (cervical, 2 and 3), those thoracic roots related to the aorta (thoracic, 2, 3 and 4), those thoracic roots related to the main mass of the abdominal viscera (thoracic, 9, 10, 11 and 12), and the sacral and lower lumbar roots. Here in a case of congenital syphilis the same roots are affected. Such findings add weight to the hypothesis that the spirochæte travels up to the central nervous system by way of the lymphatics which accompany the nerves.

Postscript.—In February, 1915, he received three injections of 0·6 grm. of neosalvarsan, and at the present time (June the 1st) his general condition is much improved; he no longer suffers from pains or bad dreams, but sight and the physical signs of nervous disease have altered but little.

A FORM OF SELF-MUTILATION OF THE PENIS IN YOUNG BOYS.†

By Thomas H. Kellock, M.C., F.R.C.S.,

Surgeon to the Middlesex Hospital and to the Hospital for Sick Children, Great Ormond Street.

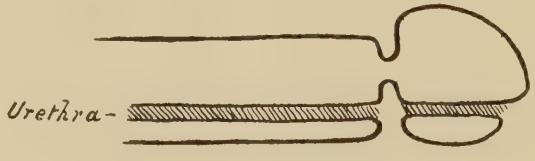
Some years ago, when I was in residence at the Hospital for Sick Children, Great Ormond Street, there were in the wards two cases of

* Head and Fearnsides, 'Brain,' 1914, xxxvii, p. 137.

† A paper read at the Clinical Section of the Royal Society of Medicine, on May the 14th, 1915.

mutilation of the penis. In the one, a boy of 8 or 9 years of age had passed a metal ring over the glans, which had remained in position for a considerable time and had caused so much swelling that it was only discovered after incisions had been made. The ring had ulcerated through the floor of the urethra, and I well remember the great trouble that was entailed in closing the fistula. In the other case, in a boy of about 3, a piece of cotton was found twisted tightly round the centre of the glans, and had also cut the urethra partially across. The child asserted that his mother had put it there because he wetted the bed. Needless to say she stoutly denied this, and I think her version that the child had done it himself was probably the correct one.

Within the last few years I have had under my care three cases of a somewhat similar character, resembling each other so closely that it would appear to be rather a common occurrence. Speaking,



Diagrammatic longitudinal section of penis.

however, to surgical friends on the subject I find scarcely anyone seems to have met with such cases, and so I suppose they are more rare than I had thought.

Of the three cases two were private ones and one in Great Ormond Street Hospital. In all of them a hair twisted round the penis just behind the glans was the cause of the trouble. The last case I saw was so typical that a description of it covers the others. The patient was a boy, 5 years of age. When 3 years old he had been circumcised for some difficulty in micturition. Soon after the operation there was some ulceration behind the glans, but the cause or nature of this was not very clear from the history. Eighteen months before I saw him there was evidently something wrong which led the mother to examine the penis, and she found a piece of hair "hanging round it," as she expressed it. The free part of this, about 4 in. in length, she cut off. This did not bring about any improvement, and a few weeks before I saw him he was found to be passing all the urine from an opening on the under surface of the penis.

When I saw the boy in January of this year the glans penis was considerably enlarged, very hard and somewhat dusky in appearance.

It was almost completely separated from the rest of the organ, the isthmus connecting them being only $\frac{1}{8}$ in. across, and the urethra was completely divided. Epithelium had grown over both faces of the sulcus and across the isthmus, so that there was no raw surface.

Under an anæsthetic the use of a crochet needle at once detected a human hair tightly twisted three times round the isthmus.

The history and condition in the other two cases was practically exactly the same, except that no hair had been seen or removed. The children had both been circumcised, and there was a long history of ulceration and swelling followed by the formation of a fistula, and in both of them the urethra was found completely divided. In two of the three cases the children had long hair, and I thought what I removed was one of their own; but in the case I have described the hair that was removed was dark, whereas the child was fair, the mother's explanation of this being that the boy slept in the same room as a lady-help who had dark hair, and he might have obtained one of hers.

The condition in all these cases had been of long standing, and from want of recognition of the cause had been allowed to go on until complete division of the urethra had resulted.

My impression is that it is brought about by the children themselves; that they twist the hair round behind the glans which has been exposed by the circumcision and subsequent erections cause it to cut in; but it is difficult to explain why this process should continue until it has divided the urethra.

The father of one of the children, writing to me some time later, says: "Very curiously the doctor who treated him when he left the Home had an exactly similar case recently; but owing to the experience he gained with our boy he was able to locate the trouble, and found six strands of hair which had cut through to the urethra, but had not actually cut it."

As to treatment, prevention is, of course, the best. This is one of the troubles that may follow a complete circumcision with permanent exposure of the glans, and so is an argument in favour of a modified operation where some prepuce is left. Failing prevention, an early recognition of the cause and its removal would prevent serious consequences. When the latter, in the shape of a deep sulcus, a narrow isthmus, and division more or less complete of the urethra have occurred, a plastic operation must be performed, and this is a matter of considerable difficulty.

I am glad to say that in two of the cases I have been able to promote adhesion between the divided surfaces and re-establish the

urethra. In the other case the attempt to do so was followed by gangrene of the glans, and so the child is left in the unfortunate condition of having a penis without a glans and the possibility of trouble with stricture at the opening of the urethra, which fortunately up to the present has not occurred.

Royal Society of Medicine.

CLINICAL SECTION.

Friday, May the 14th, 1915.

A Case of Double Osteotomy of Tibiæ ten years after Operation.—Mr. Thomas H. Kellock.—The patient was a boy, now aged 13 years. When three years of age he had badly deformed tibiæ which were much bowed outwards and forwards, and there was a separation of the internal condyles of the femora, where the malleoli were touching, of three inches. Open osteotomy of the tibiæ was performed, the fibulæ fractured, and the legs put up in plaster of Paris splints. The legs were now quite straight, and in the skiagram there was practically no indication of where the osteotomies had been done, the line of the bone being normal. The boy was now in hospital for abdominal trouble, probably tuberculous peritonitis.

A Form of Self-mutilation of the Penis in Young Boys.—Mr. Thomas H. Kellock. (*Vide* p. 209.)

Abstracts from Current Literature.

Medicine.

The significance of prenatal eruption of teeth (*'Riv di Clin. Pediat.,'* 1914, xii, *p.* 241).—**A. Beretta** states that in precocious dentition, generally affecting the lower incisors, but sometimes other groups of teeth, it is necessary to distinguish for greater exactitude a *dentitio præcox* found in infants of 4, 3, or even 2 months, a *dentitio præcocior seu natalis* which appears during the first few days after birth, and a *dentitio præcocissima seu prenatalis* met with in infants born with teeth already erupted. Teeth prematurely erupted must be further differentiated according to the stage of development which they present, whether late or early, in relation to the normal in analogous periods of the life of the child. These teeth must be examined in their histological and parasitical aspects to ascertain if the different dental and peridental tissues present a normal or pathological structure, such as pulpitis, pericoronitis, folliculitis, or alveolitis. Teeth already erupted at the time of birth have generally a disposition to fall out, either from deficiency in the development of their roots or from inflammation. Such teeth usually call for extraction, not for the commonly supposed reason that their presence interferes with normal suckling, from pain caused,

or from traumatic lesions conducing to infective processes, but because the infant cannot exercise the requisite suction owing to the deficiency of adaptation which leads to paradental ulceration. Precocious dentition and dentition at birth have not the same significance as prelacteal dentition. Precocious dentition, which is often familial and hereditary, is almost always the expression of peculiar somatic conditions connected with individual constitution, certain diseases, and with general or local changes in the organism. Eruption of teeth at the time of birth occurs in about one in 5000 births and hence is a somewhat rare occurrence, contrary to the opinion of some observers. In a unique case occurring in the author's practice there was fœtal or antenatal eruption of the two lower central incisors in an infant born prematurely. Pathological examination showed clearly a hæmorrhagic process in the sub-odontoblastic zone with marked lesions of the vascular endothelium. There was no trace of leucocyte infiltration. The author thinks it irrational to attribute precocious eruption to a single general cause. Each case must be investigated with regard to somatic type, individual constitution, diseases, and other general and local changes. From the investigation of recorded cases and the scanty pathological and histological details given in them and from those recorded by the author it seems justifiable to suppose that whatever be the mechanism of the eruption the stimulus to precocious eruption, in some cases at all events, consists in an alteration of the dental and peridental tissue, either primary or secondary to some toxic infection of the organism.

VINCENT DICKINSON.

Congenital transposition of the stomach to the left side of the chest (*'Practitioner,'* 1914, XCIII, *p.* 720).—**L. E. Graves** made a post-mortem examination on a female infant, aged 18 months, and found in addition to the congenital displacement of the stomach that the duodenum and part of the jejunum lay on the superior surface of the diaphragm.

F. R. B. ATKINSON.

Gastric digestion in infants (*'Am. Journ. Dis. Child.,'* 1914, VII, *p.* 305).—**M. Hahn** has studied the acidity and ferment activity of the gastric juice in normal infants. For measuring the strength of HCl he regards all titration methods as inaccurate, and relies upon a method giving the hydrogen-ion concentration. This consists in noting the colour changes produced by adding various indicators to the solution of gastric contents without titration and comparing them with a table constructed from solutions whose acidity has been determined electrometrically. The indicators used are methyl-orange, paranitrophenol, and lacmus. He finds that the hydrogen-ion concentration $(H) = 1{\cdot}0 \times 10^{-3}$ is the normal at the height of digestion for infants fed on one third cream-milk and two thirds milk. This is the optimum reaction for rennin and gastric lipase; pepsin is inert at this reaction. Peptic digestion of casein is, therefore, unimportant for the infant.

REGINALD MILLER.

The effect of sugars in the gastric secretions in infants (*'New York State Journ. Med.,'* 1914, XIV, *p.* 499).—**Sherman** and **Lohnes** record their experiences of the effect of milk sugar, cane sugar, and malt sugar on the gastric secretions of infants. The sugars were all in a 6 per cent. solution in a similar barley water mixture. The authors found that cane sugar

was only slightly more stimulating to the stomach than milk sugar. Malt sugar in the form of dextri-maltose was at least twice as stimulating to the gastric secretion as either milk or cane sugar. J. Allan.

The pylorus, pylorospasm, and allied spasms in infants (*'Am. Journ. Dis. Child.,'* 1914, vii, *p.* 184).—**A. Hess** has studied a number of cases of infants in whom an obstruction was found to the passage of a duodenal catheter, but in each of whom the obstruction could be overcome and the pylorus ultimately traversed. He finds that the diameter of the pylorus is about 4·75 mm. in newborn infants, and 6 mm. at three months of age. He was able to demonstrate pharyngospasm, cardiospasm, pylorospasm, and pyloric insufficiency in newborn children. He concludes that there is a distinct individuality in the tonicity of the pylorus. He regards visible gastric peristalsis with "persistalic pseudo-tumour" as not necessarily implying organic pyloric obstruction, nor even pylorospasm. On the other hand, a palpable pyloric tumour was never found in any case in which the catheter could be made to pass through the pylorus, nor did the presence of the catheter in the pylorus render it palpable. In some cases of pylorospasm gastric hypersecretion was present, but this is not the cause of marked cases which will not admit the passage of a duodenal catheter. Pylorospasm was rarely found in an isolated spastic symptom, being usually associated with one or more of the following: Pharygospasm, cardiospasm, laryngospasm, or anospasm. Reginald Miller.

Pyloric stenosis in infancy (*'Arch. of Ped.,'* 1914, xxxi, *p.* 809).—**Mark Reuben** regards pyloric stenosis of infants as due to two groups of cases—the spasmodic and the congenital hypertrophic. In the latter group symptoms may be produced by superadded spasm, the degree of organic stenosis being variable in different cases. He holds that no case should be operated upon if a duodenal catheter can be passed through the pylorus. Reginald Miller.

Pyloric obstruction in infants (*'Lancet,'* 1914, ii, *p.* 987).—**C. H. Miller** gives notes of ten cases, three of which terminated fatally. The chief points in treatment are: Keep the patient warm; wash out the stomach. Predigested milk will be for a long time the sole diet. The author prefers liquor pancreaticus for the purpose of digesting milk. The milk should at first be given a teaspoonful at a time every half hour. When this amount is tolerated the interval and quantity may be increased. When the patient is beginning to thrive he has found virol and albulactin useful as additional foods. Drugs are occasionally useful. When there is much colicky writhing and abdominal tenderness he gives tinct. opii ♏ $\frac{1}{4}$, or chlorodine ♏ j, three times a day for three days. He has tried belladonna, but found it useless in this disease. The bowels have to be kept open. An occasional dose of castor oil, followed by grey powder, will often be sufficient. Petroleum emulsion is also useful. Phenolphthalein is, perhaps, the most satisfactory drug to use regularly. Regarding the question of whether such cases should be treated by the physician or the surgeon he summarises his views as follows: (1) Some cases can be treated by the physician. (2) Some cases would be better treated by the surgeon; but whether they are or not, medical treatment will be necessary. (3) Whether the treatment is medical or surgical, neither will be effective without the care of a specially skilled nurse. J. Allan.

One hundred and forty-one cases of recurrent vomiting in private practice (*'Am. Journ. Dis. Child.,'* 1914, VIII, *p.* 292),—**C. G. Kerley** describes this condition in seventy boys and seventy-one girls. More than half had been difficult feeders in infancy. The occurrence of acetone in the urine was noted with but few exceptions. The onset occurred at six months of age in the youngest, and at eight years in the oldest. The interval between the attacks varied from two to six months, the average being eight weeks. The attacks lasted from a few hours to thirteen days, the average being three and a half days. The temperature during the attacks varied from 105° F. to 100° F. Forty-one per cent. of the children affected were subject to repeated attacks of recurrent bronchitis, which occurred in some instances contemporaneously with the vomiting. The following modifications in diet are recommended. Substitution of fish and poultry for red meats, which are to be taken sparingly and on only three days in the week. The complete omission from the diet of milk, cream, and sugar is recommended. Saccharine is substituted for the last named; 5 gr. of sodium salicylate and 10 gr. of sodium bicarbonate are given thrice daily, with massage and physical exercises for months, and, if necessary, years. In the acute stages 5 gr. of sodium bicarbonate to 8 oz. of water are given freely with colonic irrigation with sodium bicarbonate (2 drm. to 8 oz.). The author concludes that this condition is frequent in the children of gouty parentage, less frequently met with at puberty, and is intensified in winter.

CHRISTOPHER ROLLESTON.

Beta-oxybutyric acid determinations in recurrent vomiting (*'Boston Med. and Surg. Journ.,'* 1915, CLXXII, *p.* 164).—**W. S. Parker** examining by means of bismuth meals and enemata a child subject to attacks of recurrent vomiting, concluded that there was some degree of obstruction in the neighbourhood of the cæcum, and that the attacks of vomiting were associated with this. While under observation a periodic attack developed, which ceased as soon as the bowel was thoroughly cleared by enemata. During the attack, lasting seven days, the urine contained from 0·9 to 1·7 per cent. of beta-oxybutyric acid, representing a daily output of from 5 to 10·5 grm. Later, a laparotomy showed some dilatation of the stomach and a considerable degree of dilatation of the cæcum. The organ was unfolded and the appendix was removed. No attacks of vomiting occurred for the next ten months, but then recurred, although much less severe in type. The author suggests that more cases of cyclical vomiting should be subjected to skiagraphic examination of the alimentary tract.

REGINALD MILLER.

Persistent vomiting associated with rumination (*'Am. Journ. Dis. Child.,'* 1914, VIII, *p.* 310).—**F. H. Bartlett** describes the case of a $5\frac{1}{2}$ months infant, which was at first breast-fed for four weeks and then brought up by bottle unsuccessfully. Various foods were tried, but vomiting occurred after every meal, and the weight, which was $8\frac{3}{4}$ lb. at birth, fell after five months to 8lb. It was noticed that after each meal the baby began a suction motion of the tongue, which was pushed out between the lips and then withdrawn. With each projection of the tongue milk came into the mouth. A more solid food was prescribed, consisting of at first barley flour four tablespoonfuls and milk one quart, increased to six table-spoonfuls of barley later. The object of this alteration in the dietary was to provide a food of too great a consistency to be pumped out of the stomach. In three weeks

the infant gained 4 lb., and at ten months weighed 19 lb. 14 oz. Craniotabes and a prominent abdomen were present. The author concludes that young babies can tolerate larger quantities of starch than have hitherto been given.

CHRISTOPHER ROLLESTON.

Duodenal ulcers in infancy (*'Am. Journ. Med. Sci.,'* 1914, CXLVIII, *p.* 702).—**B. S. Veeder** states that of five cases four were diagnosed clinically, and in three instances the diagnosis was confirmed by autopsy. All the cases were marasmic and were under six months old. In only one case were there pronounced dietetic errors. Three began on breast-milk. Vomiting was present in all five cases. Hæmorrhage from the bowels was present in four. Massive hæmorrhage from the bowel, in the absence of polypi or ulceration of the large intestine, when associated with vomiting, is highly suggestive of duodenal ulcer. Severe collapse occurs in many cases at the time of the hæmorrhage. It is important to test the fæces of wasting and vomiting children for occult blood. The prognosis is unfavourable. Surgical interference is not advisable owing to the severe intestinal disturbance. The ulcers may be either single or multiple, and are either superficial or deep, involving all the layers of the intestinal wall. They are placed between the pylorus and the ampulla of Vater, and are nearly always on the posterior wall. They may be chronic and eventually heal. They occur in early infancy; very few are found after the age of five to six months.

CHRISTOPHER ROLLESTON.

Duodenal catheterisation and feeding in infants (*'Interstate Med. Journ.,'* 1914, XXI, *p.* 953).—**A. F. Hess** has used the duodenal catheter with success in cases of pyloric obstruction in infants. A long Nélaton catheter, graduated to 40 cm., is employed, and this, with a little practice, can easily be passed through the pyloric sphincter into the duodenum, especially if some water has been introduced into the stomach. By this means the spasm either at the cardiac or at the pyloric orifice can be estimated, and the presence of a muscular hypertrophy be determined. If a No. 15 can be inserted into the duodenum, the probability is that the obstruction is merely spasmodic and not organic, though the converse is not necessarily true. In cases of persistent vomiting, whether due to pyloric obstruction or occurring as a complication of an acute infectious disease, duodenal feeding is often of the greatest value. Food should be given warmed, and must be introduced slowly and in not too large a quantity at a time. In many cases of pyloro-spasm death results, not from inanition, as would be supposed, but from alimentary intoxication brought about by giving excessive quantities of food. Duodenal feeding may be used exclusively or only occasionally, perhaps once or twice a day.

T. R. WHIPHAM.

Acute yellow atrophy of the liver in childhood (*'Riv. di Clin. Pediat.,'* 1914, XII, *p.* 653).—**C. Francioni** describes two cases, aged 7 years and 3 years. He finds only forty-six similar cases previously recorded. There seems to be two stages in the clinical picture, (1) in which the symptoms are not characteristic, and consist only of manifestations of a simple gastro-enteric catarrh, for the most part followed by signs of obstructive jaundice not distinguishable from common catarrhal icterus. (2) After the illness has progressed in this way for a varying period of time without any special symptoms indicative of the grave turn the disease is going to take, a more

or less rapid appearance of threatening symptoms supervenes. It is probable that the symptomatology of the second stage does not exactly coincide with the anatomical stage during which the destructive lesions in the liver are developing, it corresponds rather to that phase of this stage in which profound lesions are not only already produced, but have even reached such a degree of intensity and extent as to give rise to serious and irremediable deficiency of the hepatic function. It is, therefore, not possible to gauge the exact point at which the liver begins to become seriously affected, and this explains the futility of therapeutic measures on the course of the disease, since energetic treatment cannot be adopted before the lesion of the liver has become irremediable. VINCENT DICKINSON.

Subacute atrophy of the liver (*'Am. Journ. Dis. Child.,'* 1914, VIII, *p.* 357).—**E. C. Dickson.**—A male child, aged 2 weeks, developed severe jaundice, which persisted without intermission till its death at five months of age. The child developed normally, and was never acutely ill till twenty-four hours before death. At three weeks of age the liver and spleen were enlarged, but no other abnormalities were found. The stools were not acholic at any time, and Wassermann's reaction was negative. Death was preceded by severe respiratory distress and abdominal distension. The necropsy showed marked ascites, a small granular liver, a large indurated spleen, and large kidneys, with marked parenchymatous degeneration. There was extreme general icterus, but no demonstrable stenosis of bile-ducts. Microscopically there was complete necrosis of the liver, except a small zone round the margin, where there was evidence of regeneration of liver tissue. The spleen, kidney, pancreas, and thymus showed beginning fibrosis, but the blood-vessels in all the organs were apparently normal. There were marked parenchymatous and fatty degeneration, and also necrosis of the renal epithelium. J. D. ROLLESTON.

Cholesterol metabolism in a case of congenital hæmolytic jaundice with splenomegaly (*'Interstate Med. Journ.,'* 1915, XXII, *p.* 138).—**J. Rosenbloom** and **J. P. McKelvy** found that in a case of congenital hæmolytic jaundice there was a considerable loss of cholesterol in the fæces, and they think that the hæmolytic jaundice in these cases may possibly be "due to the fact that owing to some perversion of metabolism there is a lessened cholesterol content of the blood-serum and not enough cholesterol present to exert its antagonistic action to prevent hæmolysis which might occur, due to absorption of various substances from the intestines and other organs." Cholesterol has been found to inhibit the activity of certain hæmolytic agents, just as lecithin accelerates it. The increased excretion of cholesterol may also account for the attacks of abdominal pain suggestive of biliary colic that is present in the disease. These attacks may be due to the presence of gall-stones formed from the abnormal cholesterol metabolism, and it is noted that gall-stones have been found in a majority of cases in which the gall-bladder has been examined. T. R. WHIPHAM.

Epidemic icterus (*'Med Record,'* 1914, LXXXV, *p.* 710).—**A. Strauch** reports a personal experience of two families affected with a mild type of this complaint. In one, four children were affected within a period of two or three weeks: in the other, eight. The two families lived within two blocks of each other. The cases occurred in November and December. The author thinks that such cases as these cannot be attributed to a spreading

of an ordinary gastro-duodenal catarrh, and is inclined to regard them as due to a specific infectious agent. REGINALD MILLER.

Intestinal putrefaction with convulsions (*'Boston. Med. and Surg. Journ.,'* 1914, CLXXI, *p.* 819).—**W. L. Thompson** describes the case of a boy, aged 6 years, who had been stated to have been suffering from epilepsy since the age of two years, and had been treated accordingly without success. The features of the case were as follows: (1) The great number of convulsions daily (fifty); their mild character; their brief duration (one to two minutes); their occurrence for three consecutive years. (2) Sound mental and physical health. (3) Rapid cure by phenolsulphate of zinc with cascara sagrada every four hours for five days, then ½ oz. of mag. sulph. on the sixth evening and morning, and 5 gr. of thymol with another ½ oz. of mag. sulph. the next morning; complete suspension of food and drink except a little water for thirty-six hours, and then the usual diet with a suspension of lactic-acid bacilli in pure culture. F. R. B. ATKINSON.

The care of the abdomen in infancy and childhood (*'New York State Journ. Med.,'* 1914, XIV, *p.* 566).—**E. M. Mosher** is of opinion that much ill-health results from want of care of the abdomen in early life, and strongly emphasises the value of preventing intestinal stasis. It is argued that enteroptosis, sectional or general, is the chief underlying cause of stasis in the gastro-intestinal canal, that weakness and distensibility of the abdominal wall, together with the vertical posture of the trunk, are prime factors in its causation; that infancy and childhood are periods of especial danger because of the still undeveloped condition of muscle fibre and other tissues, the flexibility of the spine, and the inevitable crowding of the abdominal viscera between diaphragm and pelvis in early attempts to maintain the sitting posture. Among the suggestions made for the prevention of enteroptosis in infants and children may be mentioned: Proper feeding, with especial reference to the time element and the quantity of food given; a longer continuance of the horizontal posture of the trunk than is common; a life in the open air—free from bumps and jolts; prevention of mental forcing and early precocity; development of the abdominal muscles by every means possible. J. ALLAN.

Surgery.

A case of large myeloid of mandible (*'Med. Journ. of Austral.,'* 1914, I, *p.* 106).—**R. Douglas.**—The tumour was removed from a boy, aged 14 years. Sufficient time had not yet elapsed to say whether recurrence would occur or not. F. R. B. ATKINSON.

Sarcoma of the tongue (*'Journ. Amer. Med. Assoc.,'* 1915, LXIV, *p.* 291).—**W. T. Coughlin** reports two cases of sarcoma of the tongue; one in a boy, aged 14 years, and the other in a man, aged 19 years. In both cases the growth was of a few months' duration, and there was a history of the patient having bitten his tongue some time previously. The growth in each case was a mixed-cell sarcoma. The writer gives a study of fifty-eight reported cases. T. R. WHIPHAM.

Congenital pyloric stenosis in an infant, aged 7 weeks, treated by gastro-enterostomy (*'Dub. Journ. Med. Sci.,'* 1914, II, *p.* 280).—

C. A. Ball was called to see an infant whose bowels had not moved for ten days. The infant from birth was said to be healthy. Oil and enemata had no effect, and it vomited when fed, and passed no urine. It was, therefore, considered that there was obstruction high up. On opening the abdomen the pylorus was found to be greatly enlarged, and this enlargement appeared to extend into the duodenum. The swelling was hard and smooth on the surface. Plastic operation was not possible, as the obstruction seemed to be complete and was very hard. The abdomen having been opened, and it being apparent that the child would die if nothing was done, it was decided to do a gastro-enterostomy. The child was very weak for two or three days, but in about twenty-four hours after the operation the bowels moved, and three weeks after it was quite strong and healthy. The author referred to a method of treatment which had been suggested in these cases, viz., washing out the stomach and giving the child enemata, but he considered that this little patient had gone too far for this treatment to be of any use.

J. Allan.

The pylorus after gastro-enterostomy for congenital pyloric stenosis (*'Journ. Amer. Med. Assoc.,'* 1915, lxiv, *p.* 410).—**D. Lewis** and **C. G. Grulee** report on the condition of the pylorus in a case of congenital pyloric stenosis 256 days after gastro-enterostomy had been performed. The patient was a male, aged 2 months, who was admitted with typical signs of pyloric stenosis. Three days later a posterior gastro-enterostomy was performed and at the operation the pylorus was found to be enlarged, white, and somewhat œdematous and hard. The child did well and four and a half months later went through an attack of pneumonia. A second attack of pneumonia occurred after another four months, and then the child succumbed. The stomach was found to be of normal size. The pylorus was of about the same size and consistency as at the operation. From the duodenal side the enlargement projected into the lumen of the bowel. When the stomach was opened the lumen admitted a fine probe and was surrounded by a rigid wall, which microscopically was composed of an enormous hypertrophy of the circular muscular coats and some hypertrophy of the longitudinal as well. The mucous membrane was thrown into folds and not contracted. The gastro-esterostomy was apparently functioning properly. The fact that the pylorus was unchanged is in favour of surgical treatment when once the diagnosis is established.

T. R. Whipham.

X-ray examination following operation for congenital pyloric tumour (*'Boston Med. and Surg. Journ.,'* 1915, clxxii, *p.* 166).—**C. L. Scudder** takes the extreme surgical view with regard to hypertrophic pyloric stenosis. Not only does he deny that pyloric spasm is the cause of the disease, but he will not allow that it plays any part in the production of the symptoms. Consequently, operation is necessary in every case. This view he supports by the results of skiagrams taken after a bismuth feed in cases which have been operated upon (posterior gastro-jejunostomy) from one to eight years previously. In all twenty-six cases the same result was noted, namely, that the bismuth passed through the stoma and none traversed the pylorus.

Reginald Miller.

The danger of delay in the diagnosis and treatment of intussusception in infancy (*'Med. Record,'* 1915, lxxxvii, *p.* 218).—**E. W.**

Peterson reviews the literature, including Clubbe's paper (*vide* British Journal of Children's Diseases, 1909, vi, *p.* 311), which, he says, should be an inspiration to every pædiatric surgeon, and records nineteen personal cases in infants, aged from 6 days to 13 months. All were breast-fed and were healthy and well nourished with one exception. An abdominal tumour was felt in all. Every case seen within forty-eight hours of the onset was cured by laparotomy. The fatal cases had all been brought in later. In 13 Peterson performed manual reduction of the invagination with 9 recoveries and 4 deaths, and in 6 resection or enterostomy, with 1 recovery and 5 deaths. He concludes that early laparotomy with manual reduction of the invagination is the safest, simplest, and most successful method of treatment.

J. D. Rolleston.

Intussusception caused by an inverted Meckel's diverticulum (*'Journ. Amer. Med. Assoc.,'* 1915, lxiv, *p.* 1065).—**C. R. Hancock** reports the case of a boy, aged 2 years, who was operated upon for an intussusception. The invagination was 10 in. in length, and consisted of part of the ileum, cæcum, and part of the transverse colon. The intussusception was reduced and at its apex was found an inverted Meckel's diverticulum $2\frac{1}{2}$ in. in length. This was pushed into its normal position, and was then excised. The patient made a good recovery.

T. R. Whipham.

Spasmodic ileus simulating intussusception (*'Journ. Amer. Med. Assoc.,'* 1914, lxiii, *p.* 1391).—**J. D. Butzner** reports the case of a breast-fed female infant, aged 8 months, who, two hours after a normal stool, suddenly became ill. The face was pale and sweating, the legs were drawn up, and screaming occurred at intervals. The abdomen was flat and relaxed except in the upper right quadrant, which was slightly rigid and tender. Here a cylindrical mass could be felt extending across the mid-line. An enema produced some blood-stained mucus, but no fæces or gas. A rectal examination was negative. A diagnosis of intussusception was made, and in the morning (twelve hours later) a laparotomy was performed. The upper part of the small intestine was distended, but the distension ceased suddenly and the lower part was absolutely empty and flat. The colon was normal, but contained a considerable quantity of blood. The condition was that of spasmodic ileus. The intestines were replaced, the abdomen was closed, and the lower bowel washed out with saline solution, and atropine and morphine were administered. The patient made a rapid recovery. The author thinks it possible that cases of reported spontaneous reduction in intussusception are really cases of spasmodic ileus, but that there is no safe way of differentiation between the two except by exploratory operation.

T. R. Whipham.

Cavernous and cystic lymphangioma of the cæcum (*'Journ. Amer. Med. Assoc.,'* 1915, lxiv, *p.* 719).—**E. A. Babler** reports the case of a boy, aged 15 years, who was operated upon for what was thought to be an acute infection of the appendix with abscess formation. A firm mass about the size of a man's fist was found situated to the outer side of and intimately connected with the cæcum. The appendix was free and did not show evidence of inflammation, and the mesenteric glands were not enlarged. The diagnosis of probable carcinoma of the cæcum was made, and the cæcum, with the entire ascending colon and about 8 in. of the ileum, were excised, and a side-to-side anastomosis by means of a Murphy's button was performed. The

patient made a good recovery. Histologically the tumour proved to be a cystic cavernous lymphangioma. T. R. WHIPHAM.

Congenital inguinal implantation of the vermiform appendix (*'Journ. Amer. Med. Assoc.,'* 1915, LXIV, *p.* 819).—**H. W. Wade** reports the case of a coloured male infant, aged 6 months, who died from pneumonia. At the necropsy the appendix was found to extend downwards for a distance of 6 cm. to the internal abdominal ring, being covered throughout by a fold of the peritoneum, which extended from the caput coli to the border of the true pelvis, and was evidently an extension of the meso-appendix. The appendix extended down the inguinal canal, in which it was acutely bent, and ended in a slightly bulbous tip a short distance above the testicle. In the canal there was neither remnant nor trace of the funicular process of the tunica vaginalis or of a subsequently formed peritoneal diverticulum. T. R. WHIPHAM.

Chronic appendicitis (*'Med. Press,'* 1915, XCIX, *p.* 392).—**J. Boyd Barrett** in dealing with chronic appendicitis in children states that of the last 42 operations for appendicitis at the Children's Hospital, Temple Street, Dublin, 24 were done during the chronic stage and only 16 during the acute, which included suppurative conditions. The author lays stress on the fact that in operating upon children Jackson's membrane must receive the same attention as in adults. The relative length of the appendix in children, its poor blood-supply, and its abundance of lymphoid tissue render it liable to inflammation. The meso-appendix is short, and if it becomes œdematous and the appendix stiff and catarrhal there is a tendency to kink and so diminish the blood-supply to the extremity. The omentum in young children is so short that it cannot wall-off an abscess, and the prevention of general peritonitis can only be brought about by neighbouring coils of intestine. This accentuates the necessity for early appendicectomy. T. R. WHIPHAM.

Hirchsprung's disease (*'Cleveland Med. Journ.,'* 1915, XIV, *p.* 1).—**Wm. E. Lower** gives a summary of the theories concerning the causation of dilatation of the colon, which include mechanical, neuropathic, inflammatory, and congenital factors. It is three and a half times more common in males. Constipation and abdominal distension are the primary symptoms. The subjects of this disease are emaciated and often affected with tetany, and in children the mentality is often impaired. The best surgical treatment is to divide the ileum and implant it into the rectum. If improvement ensues, the large bowel above the anastomosis is excised. Lower excised the entire colon from the hepatic flexure to the rectum in a boy of 11, who was attending school. Every month he had attacks of complete obstruction with considerable difficulty in emptying the colon. The contents of the bowels weighed 8 lb. The patient died, but not from any local condition. CHRISTOPHER ROLLESTON.

Tuberculosis of the hernial sac: some points in its pathology and clinical course (*'Clin. Journ.,'* 1914, XLIII, *p.* 609).—**J. T. Morrison.** —About 25 per cent. of the cases are found in children under 5 years of age. It is usually believed to be secondary to a focus elsewhere. Hydrocele is frequently present with it; the pathological changes may consist of grey tubercles, the fibro-caseous type, viz., nodules which may or may not break

down and form pus. An irreducible swelling is commoner than in uncomplicated herniæ. The cord and sac may be markedly thickened. The mortality is about 11 per cent. F. R. B. Atkinson.

Pneumococcus peritonitis (*'New York Med. Journ.,'* 1914, c, *p.* 1167).—**Kahn** gives the diagnostic points as follows: Sudden onset with high fever, pain, vomiting, diarrhœa. Abdominal rigidity may or may not be marked. The patient is ill out of all proportion to the abdominal signs. Leucocyte count is high. In one half the cases the lung is not involved. The process is at first general and later tends to be localised, and the author considers operation is best delayed till the localisation has occurred, if the diagnosis be certain. J. Porter Parkinson.

Streptococcal peritonitis of genital origin (*'Arch. de Méd des Enf.,'* 1914, xvii, *p.* 441).—**H. Schwers.**—A girl, aged 2 years and 4 months, was admitted to hospital with acute peritonitis. A diagnosis of perforated appendix was made and laparotomy performed. Diffuse peritonitis was found, but the appendix and other abdominal organs were normal. Death occurred four hours after the operation. The necropsy showed acute purulent infection of the whole genital tract. Cultures from the pus of the abdominal cavity and the genital organs showed numerous streptococci and a few staphylococci, but no gonococci. J. D. Rolleston.

Some acute surgical diseases of the abdomen in children (*'New York State Journ. Med.,'* 1915, xv, *p.* 133).—**L. Miller Kahn** remarks on the progressive development of surgical treatment of intra-abdominal affections in children. After discussing certain anatomical differences the author deals with several conditions, including appendicitis, intussusception, pneumococcus peritonitis, intestinal obstruction, in which operative interference may be called for. In the diagnosis of the acute abdomen of the child one need scarcely consider infection of the gall-bladder or perforation of gastric or duodenal ulcer, as these conditions are practically unknown. The gentle, palpating hand, with the child's attention elsewhere, is very informing. A full urinary bladder has often obscured a possible diagnosis. No examination of a sick child is complete without a bi-manual palpation of the abdomen; that is, with one finger in the rectum and the other hand on the abdomen. Referred pain in the abdomen must never be out of mind. Practically all of the acute conditions of the abdomen of the child have a way of giving warning by sudden onset, which is followed by a period of quiescence. This quiescent period lulls the child, the parent, and often the physician. Up to a certain point children stand operation well, but there is a definite limit to their resistance, and care must be exercised not to go beyond it. Exposure of viscera, loss of blood, and prolonged anæsthesia affect children badly. Ether is the anæsthetic of choice, and preferably by the drop method. Little infants should be swathed in cotton and operated upon a warmed table. They should be protected against the loss of bodily heat. Nothing adds so much to the speed of an operation as knowing in advance what one is to deal with and what one will have to do. Recognising the pathology and going immediately to it surgically without unnecessary exploration is the best way to insure success. J. Allan.

Congenital elevation of the scapula (Sprengel's deformity) of familial type (*'Am. Journ. Dis. Child.,'* 1914, vii, *p.* 357).—**H. Neuhof.**—

In a family consisting of 19 members 11 were affected. Of the 4 parents 2 were examples of bilateral congenital elevation of the scapula. Seven of their 15 children showed the unilateral and 2 the bilateral deformity. Neuhof regards Sprengel's deformity as a manifestation of atavism.

J. D. Rolleston.

A case of Sprengel's deformity (*'Am. Journ. Med. Sci.,'* 1914, cxlviii, *p.* 521).—**G. Fetterolf** and **J. H. Arnott** describe in detail the bony and muscular anatomy of a case of unilateral deformity in a man, aged 40 years, on whom a complete autopsy was held. J. D. Rolleston.

Vicious attitude of the scapula (*'Arch. de Méd. des Enf.,'* 1914, xvii, *p.* 347).—**Nageotte Wilbouchewitch** describes a condition in which the apex of the scapula is raised to a higher level than that of the corresponding side, the left shoulder not being appreciably lowered. The scapula rotates round its articular angle, carrying the internal angle towards the cervical region, and the inferior angle upwards and forwards, the axillary border becoming horizontal and the spinal border oblique in a downward and inward direction. There is no malformation, contracture, or paralysis. The faulty position is due to the combined action of the inferior rhomboid and subspinatus muscles, perhaps in association with the two upper bundles of the serratus magnus, which are hypertrophied. The faulty position of the scapula depends on repeated and badly directed efforts on the part of the muscles to overcome the spinal curvature.

Christopher Rolleston.

Hemimelia thoracica (*'Arch. of Ped.,'* 1914, xxxi, *p.* 707).—**F. L. Wachenheim** on examination of a girl, aged 1 year, found that her left hand and left lower forearm were missing. The mother attributed this to her having seen a one-armed child when she was three months pregnant. The distal end of the stump was rounded with five projecting tubercles, each about 1 mm. high, bearing at their apices rudimentary nails. The skin of her finger-nails was intact, thus showing that her case was not one of intra-uterine amputation. X-rays showed that the upper ends of the radius and ulna were normal, the shafts stunted, the lower ends rudimentary or absent, and the carpus, metacarpus, and phalanges entirely missing. As the extremities are differentiated into three segments in the middle of the second month of intra-uterine life, the arrest of development must have taken place at least one month before the supposed maternal impression. The case also proves that the development of the skin is chiefly dependent on its being pushed out and stretched by the growth of the bones underneath. The growth of the epiblast depends entirely on that of the mesoblast, but its secondary developments, such as nails and teeth, are laid down irrespective of its growth. J. D. Rolleston.

So-called congenital scoliosis (*'Journ. Amer. Med. Assoc.,'* 1915, lxiv, *p.* 305).—**H. B. Thomas** discusses the ætiology of congenital scoliosis, and thinks that in some cases the length, insertion, and uneven attachment of the muscles may be the cause. Cases due to congenital bony defects come under a different category. An instance of the latter is reported. The patient was a girl, aged 5 weeks, with no history of syphilis. She was poorly nourished, and had a double hare-lip, cleft palate, absence of the globes of the eyes, and right lumbar and left dorsal scoliosis.

X rays showed a tilting of the pelvis to the left and abnormalities of all the vertebræ and of the ribs on the right side. The infant died from pneumonia.

T. R. Whipham.

Lumbo-sacral spina bifida; congenital articular rigidity of both knees in extension; double equino-varus; malformation of the anus (*'Journ. de Méd. de Bordeaux,'* 1914, lxxxv, *p.* 158).—**H. L. Rocher** and **J. Souchet** report this case in a female infant, aged 3 months. There was no history of syphilis. The spina bifida was of the myelo-meningocele type, and was constituted by a heart-shaped, flattened, sessile tumour, the apex directed towards the sacrum. There was no hydrocephalus. There was incontinence of urine and fæces, and rectal examination showed a lack of tonicity of the sphincter. The lower limbs showed marked atrophy of the muscles, and the patellæ were very atrophied. The anatomical form of the spina bifida contra-indicated surgical interference. The spinal hypoplasia accounted for the incontinence of urine and fæces and muscular atrophy, but it was difficult to say whether the congenital rigidity and club-foot were due to the same cause or to a vicious attitude *in utero*. The rigidity would probably be diminished by massage, and the club-foot would be treated by ordinary methods at ten months of age.

J. D. Rolleston.

Congenital absence of the left fibula (*'Journ. de Méd. de Bordeaux,'* 1914, lxxxv, *p.* 440).—**H. L. Rocher** records a case in a male infant, aged 2 years, of congenital absence of the left fibula, associated with talipes equino-valgus and antero-posterior curvature of the tibia. The whole of the lower limb was atrophied, especially in the leg portion. Rocher had previously operated on the patient's sister, aged 6 years, for a bifid right thumb. The mother had had a miscarriage four years previously, but showed no sign of syphilis, and her pregnancy and delivery in her present case had been uneventful.

J. D. Rolleston.

Review.

La Tuberculose de l'Enfant: Traitement de ses formes médicales et chirurgicales par la Tuberculine. By D. L. Jeanneret. Preface by Prof. Hutinel. Paris: J. B. Baillière et fils. 1915. Price 6 fr.

The title of this work is likely to be misunderstood, as it gives one the idea that it is devoted to treatment, whereas of the 157 pages only 37 are concerned with treatment and 120 to generalities and narration of cases. The author devotes a large space to the opinions of numerous pædiatrists regarding tuberculin treatment and also considers the theories advanced to explain its action. He is a warm advocate for the treatment by intradermo injection proposed by Mantoux, with old tuberculin for preference, and considers with a good deal of redundancy that it is the treatment *par excellence*. He describes fully the dosage and method of employment of tuberculin and also describes Beraneck's tuberculin, but shows it is much more expensive than tuberculin and therefore has its limitations. The author makes out a good case for his method of treatment *à la* Mantoux, which is well worthy of trial, and those desirous of trying it should read his book.

F. R. B. A.